

# PATENT ABSTRACTS OF JAPAN

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## (54) INFORMATION SYSTEM

(57)Abstract:

PURPOSE: To provide an exclusive information system using a recording carrier which cannot be copied easily.

CONSTITUTION: The information system is provided with the recording carrier 1 and a reproducing device, and information is recorded in the recording carrier as a shape of the fluctuation of a first physical parameter. The reproducing device scans the recording carrier by a converter 41 which responds to the fluctuation of the first physical parameter, and an information restoring circuit 42 restores information by a detecting signal received from the converter 41. The recording carrier 1 shows the second fluctuation of the second physical parameter of a kind which is detected by the converter though being different from the first physical parameter. A detecting circuit 43 detects the existence of the second fluctuation, based on the detecting

signal received from the converter 41 and a circuit 44 responding to the detecting means gives power to the information restoring circuit 42 when the second fluctuation is detected. An ordinary type of copying machine does not copy the fluctuation of the second physical parameter but copies only the fluctuation of the physical parameter which expresses information. Copying information obtained by such type of copying machine is not restored, and the copying of the recording carrier no longer becomes to execute.

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## CLAIMS

[Claim(s)]

[Claim 1] the -- with the record carrier on which information was recorded with the gestalt of fluctuation of 1 physical parameter the [ said ] -- the means for scanning a record carrier by the converter which answers said fluctuation of 1 physical parameter -- and an information system equipped with the regenerative apparatus which was able to establish the means for recovering information from the detecting signal received from said converter -- setting -- said record carrier -- the -- the 2nd fluctuation of 2 physical parameter -- expressing -- the [ the ] -- 2 physical parameter -- the [ said ], although it differs from 1 physical parameter It is based on that it is a class detectable [ with said converter ] and the detecting signal with which performance equipment is received from a converter. The detection means for

detection of the existence of said 2nd fluctuation, And the information system characterized by having a means to answer a detection means in order to enable recovery of information, when existence of said 2nd fluctuation is detected.

[Claim 2] The information system according to claim 1 characterized by having the means for expressing the modulation pattern with which said 2nd fluctuation expresses a sign, answering a recovery means for a detection means recovering said sign from a detecting signal, and recovery of said sign, and activating a possible-ized means.

[Claim 3] It is the information system according to claim 2 which the recorded information is the thing of a class recoverable [ with data processing for which it be opted beforehand ], and the sign expressed with the modulation pattern of the 2nd fluctuation is directing the class of data processing which should be used in order to recover information, and is characterized by to be formed in equipment the means for setting a recovery means as the mode in which data processing which is directed by the recovered sign, and for which it was opted beforehand is performed.

[Claim 4] It be the information system of said claim characterize by for said record carrier be the thing of the class which can be read optically , and equip information with a means for the pattern of the optically detectable mark arrange along a truck be record and said transducer turn a radiation beam to up to a radiation induction detector through a radiation induction detector and a record carrier in it given in any 1 term .

[Claim 5] It is a servo control means for [ which controls at least one scan parameter to the value beforehand decided based on the detecting signal received from the radiation induction detector ] controlling a scan it being able to fold. It is influenced by 2 physical parameter and this servo control means has the frequency bandwidth decided beforehand. and it -- the [ said ] -- the [ said ] -- said fluctuation of 2 physical parameter the [ the outside of the bandwidth of a servo control means, and ] -- the information system according to claim 4 characterized by producing fluctuation by the detecting signal showing the frequency spectrum put on the outside of the frequency spectrum of signal fluctuation raised by fluctuation of 1 physical parameter.

[Claim 6] said servo control -- a control means -- discovering -- the -- the information system according to claim 5 characterized by fluctuation of 2 physical parameter being fluctuation of the truck location in the direction which crosses the direction of a truck.

[Claim 7] a servo control means -- a scan speed control means -- having -- the -- the information system according to claim 5 which fluctuation of 2 physical parameter is the average value of the die length of an optically detectable field and an optically detectable staging area, and is characterized by to have equipped performance equipment with the means for data clock recovery, and to equip the detection means with the means for detecting fluctuation with the clock frequency produced by fluctuation in said average value.

[Claim 8] the focal control means for maintaining the focus of a scanning beam substantially in the flat surface on which the field which a servo control means can detect optically, and a staging area are put -- having -- the -- the information system according to claim 5 characterized by fluctuation of 2 physical parameter being fluctuation of the location of said flat surface.

[Claim 9] A record carrier's being a compact disk and a truck It is 22kHz when scanned by the scan speed of 1.2 - 1.4 m/sec. Claims 6 and 7 characterized by becoming fluctuation of the detecting signal by the frequency which is substantially in agreement, and information system of eight given in any one line.

[Claim 10] information -- the -- the regenerative apparatus for performing the record carrier which is recorded with the gestalt of fluctuation of 1 physical parameter, and is -- it is -- the [ said ] -- with the means for scanning a record carrier by the converter which answers said fluctuation of 1 physical parameter In the regenerative apparatus in which the means for recovering information from the detecting signal received from said converter is formed this regenerative apparatus -- the [ said ] -- the [ from 1 physical parameter / different ] -- 2 physical parameter The regenerative apparatus characterized by having a means to answer a detection means in order to enable recovery of information, when the detection means for detection of the existence of the 2nd fluctuation based on the detecting signal received from a converter and existence of said 2nd fluctuation are detected.

[Claim 11] The regenerative apparatus according to claim 10 characterized by having the means for answering a recovery means for said detection means recovering a sign from a detecting signal, and recovery of said sign, and energizing a possible-ized means.

[Claim 12] The regenerative apparatus according to claim 11 characterized by the ability to establish the means for setting a recovery means as the mode in which data processing which is directed by the sign with which equipment was recovered, and for which it opted beforehand is performed.

[Claim 13] The regenerative apparatus of 12 claim 10 characterized by having the means for said transducer turning a radiation beam to a radiation induction detector through a radiation induction detector and a record carrier, 11, or given in any 1 term.

[Claim 14] It is the regenerative apparatus according to claim 13 characterized by arranging said detection means in order to detect the existence of fluctuation of said 2nd parameter based on said error signal by being characterized by the servo control means for controlling a scan in order to control at least one scan parameter to the value beforehand decided based on the error signal acquired from the detecting signal received from said radiation induction detector.

[Claim 15] The regenerative apparatus according to claim 14 it is supposed that is characterized by having the tracking control means for said servo control means controlling tracking based on the tracking error signal acquired from the detecting signal received from said radiation induction detector.

[Claim 16] The regenerative apparatus according to claim 14 characterized by having equipped said servo control means with the scan speed control means, having equipped player equipment with the means for data clock recovery further, and having the means for said detection means detecting fluctuation of a clock frequency.

[Claim 17] The regenerative apparatus according to claim 14 characterized by having the focal control means for maintaining the focus of a scanning beam substantially in the flat surface on which said servo control means is put based on the focal error signal with which an optically detectable field and a staging area are obtained from the detecting signal received from the radiation induction detector.

[Claim 18] the -- the record carrier on which information is recorded in the form of fluctuation of 1 physical parameter -- it is -- the [ said ] -- the [ from 1 physical parameter / different ] -- the record carrier characterized by expressing the modulation pattern with which said 2nd fluctuation is expressing the sign in the record carrier showing the 2nd fluctuation of 2 physical parameter.

[Claim 19] The sign which the recorded information is the thing of a class recoverable [ with data processing for which it opted beforehand ], and is expressed with the modulation pattern of the 2nd fluctuation is a record carrier according to claim 18 characterized by directing the class of data processing which should be used in order to recover information.

[Claim 20] It is the record carrier according to claim 18 or 19 characterized by being the thing of a class which can read said record carrier optically, and recording information in it as a pattern of the optically detectable mark arranged along the track.

[Claim 21] the -- the record carrier according to claim 20 characterized by fluctuation of 2 physical parameter being fluctuation of the track location in the direction which crosses the direction of a track.

[Claim 22] the -- the record carrier according to claim 20 characterized by fluctuation of 2 physical parameter being the average of the die length of an optically detectable field and an optically detectable staging area.

[Claim 23] the -- the record carrier according to claim 20 characterized by fluctuation of 2 physical parameter being fluctuation of the location of the flat surface on which said optically detectable mark is put.

[Claim 24] the [ that a record carrier is a compact disk and ] -- fluctuation of 2 physical parameter -- track Case where it is scanned with the scan speed of 1.2 - 1.4 m/sec Record carrier of 23 claims 21 and 22 characterized by becoming fluctuation by the detecting signal by the frequency which is substantially in agreement with 22kHz, or given in any 1 term.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention -- the -- the [ the record carrier on which information was recorded with the gestalt of fluctuation of 1 physical parameter, and / said ] -- it is related with an information system equipped with the regenerative apparatus which was able to establish the means for recovering information from the detecting signal received from the means for scanning a record carrier by the converter which answers said fluctuation of 1 physical parameter, and said converter.

[0002] This invention relates also to the record carrier and regenerative apparatus for carrying out a specification to said system further.

[0003]

[Description of the Prior Art] Especially the system of an above-mentioned class is known as a compact disc system. A normal compact disk is performed with all the suiting regenerative apparatus. A recording apparatus can be used by the end of today in order to copy the information which exists on a read-only compact disk on the recordable disk which may be performed with the suiting regenerative apparatus.

[0004] However, some application, for example, an audio visible game, needs the so-called "exclusive system", and the compact disk which has the software expressing an audio visible game must have been easily copied in the system by the recording device which is [ that it can only play on a special player, and ]; and can be used.

[0005] It is desirable to use as many know-how of the information system which has already existed in the viewpoint of a cost mode as possible. In order to realize a low price "an exclusive information system" to it, it is desirable not to change the information system with which only a few exists as much as possible.

[0006] However, it must be made very difficult to a third person by the copy machine which exists to copy such a special disk. The protector system of the conventional technique does not agree in this demand, for example, - scrambling / encryption ratio may be copied to a disk by the bit copy machine from a disk.

- For example, the special logical error in both or either of the main sign channel and a subsign channel of a compact disc (as opposed to copy prevention) may also be copied by the bit copy machine.

- The system which carries out a main sign channel / subsign channel relation to a request may also be copied by the bit copy machine.

[0007]

[Problem(s) to be Solved by the Invention] The purpose of this invention is offering easily the exclusive information system with which the record carrier which must have been copied is used.

[0008]

[Means for Solving the Problem] according to this invention, an information system which was defined as a part for introduction attains this purpose -- having -- and

that system -- said record carrier -- the -- the 2nd fluctuation of 2 physical parameter -- expressing -- the [ that ] -- 2 physical parameter -- the [ said ], although it differs from 1 physical parameter It is based on that it is a class detectable [ with said converter ] and the detecting signal with which performance equipment is received from a converter. The detection means for detection of the existence of said 2nd fluctuation, And when existence of said 2nd fluctuation is detected, in order to enable recovery of information, it is characterized by having a means to answer a detection means.

[0009] a bit copy machine -- usually -- the -- the fact referred to as copying only fluctuation (the fluctuation expressing the recorded information) of 1 physical parameter -- the -- fluctuation with 2 physical parameter is not copied. Therefore, a special disk must have been copied by the bit copy machine of an ordinary class.

[0010] One example of this information system is characterized by having the means for expressing the modulation pattern with which said 2nd fluctuation expresses a sign, answering recovery of a sign recovery means for a detection means to recover said sign from a detecting signal, and said sign, and activating a possible-ized means.

[0011] use of the modulation of fluctuation -- the -- it has the advantage referred to as that the existence of fluctuation of 2 physical parameter may be detected much more certainly.

[0012] Another example of this information system is the thing of a class recoverable [ with data processing the recorded information was beforehand decided to be ]. The sign expressed with the modulation pattern of the 2nd fluctuation is directing the class of data processing which should be used in order to recover information. Equipment is characterized by establishing the means for setting a recovery means as the mode in which data processing which is directed by the recovered sign and for which it opted beforehand is performed.

[0013] It has the advantage referred to as that this example needs to be able to use the sign expressed with a modulation pattern in order to recover the information read in the record carrier. Then, the information may be recorded only with the regenerative apparatus of the dedication which can recover a sign. or [ that information is enciphered before information is recorded on a record carrier ] -- or when it scrambles, the sign directs a cryptographic key or the scramble approach suitably, respectively.

[0014] Although not restricted to the information system with which the record carrier which can be read optically is used, especially this system is suitable to this kind of information system.

[0015] In an optical record carrier, it is comparatively easy to give the truck currently recorded by the truck modulation which may be detected by the same radiation beam as being used in order that information may read information.

[0016] One example of the information system with which this is realized It is a servo control means for [ which controls at least one scan parameter to the value

beforehand decided based on the detecting signal received from the radiation induction detector ] controlling a scan it being able to fold. It is influenced by 2 physical parameter and this servo control means has the frequency bandwidth decided beforehand. and it -- the [ said ] -- the [ said ] -- said fluctuation of 2 physical parameter -- the [ the outside of the bandwidth of a servo control means, and ] -- it is characterized by producing fluctuation by the detecting signal showing the frequency spectrum put on the outside of the frequency spectrum of signal fluctuation raised by fluctuation of 1 physical parameter.

[0017] the -- the fluctuation in 2 physical parameter may be the form of fluctuation of the truck location in the direction which crosses the direction of a truck. This fluctuation may be detected based on a tracking error signal.

[0018] the -- the fluctuation in 2 physical parameter may be the form of fluctuation of a plane location where the mark which can be read optically is placed. In that case, the fluctuation may be detected based on a focal error signal.

[0019] the -- the fluctuation in 2 physical parameter may be the gestalt of fluctuation by the average with the staging area placed between the marks which can be read optically again, and those marks that can be read optically. the [ in that case, ] -- the fluctuation in 2 physical parameter may be detected based on the fluctuation in the data clock signal recovered between the scans of the truck by the fixed line type rate.

[0020] the case where the record carrier used for this information system is a compact disk -- truck the case where it is scanned by the scan speed of 1.2 - 1.4 m/sec -- the -- fluctuation in 2 physical parameter It is suitable to use the information system characterized by becoming the fluctuation in the detecting signal which has the frequency which is substantially in agreement with 22kHz.

[0021] the advantage referred to as that this example cannot copy a special disk on an ordinarily recordable compact disk -- having -- that disk -- front-end slot 1.2 - 1.4 m/sec the case where it is scanned by the rate -- almost -- The front-end slot showing agitation used as the tracking error which has the frequency of 22kHz is prepared.

[0022] This pattern will not be detected because [ which was placed into the same frequency domain / of the existence of a front-end slot ] is shaken, even when it is successful to record the pattern with which the record mark equivalent to the record mark by which the record carrier which should be copied is shaken is shaken.

[0023]

[Example] Hereafter, with reference to a drawing, I will explain the example of this invention to a detail more using an example.

[0024] Drawing 4 shows one example of the information system by this invention. This information system is equipped with a means (not shown) to move a record carrier 1 along with a converter 41 so that a record carrier 1 may be made to scan. this record carrier -- the -- fluctuation of 1 physical parameter is expressed and that fluctuation is expressing the information recorded on the record carrier 1. this converter 41 --



the [ said ] -- it is the thing of the class which answers said fluctuation in 1 physical parameter. the [ on the part by which, as for the information recovery circuit 42, a record carrier 1 is scanned ] -- in order to receive the detecting signal equivalent to fluctuation of 1 physical parameter, it is combined to the output terminal of a converter 41. An information recovery circuit is the thing of the ordinary class which recovers information from said received detecting signal.

[0025] a record carrier 1 -- further -- the -- fluctuation of 2 physical parameter -- expressing -- the [ the ] -- fluctuation of 2 physical parameter -- the -- the information expressed by fluctuation of 1 physical parameter is not expressed. However, the 2nd fluctuation is also detectable with a converter 41. the [ by which the converter was detected by the converter 41 ] -- the signal equivalent to the fluctuation in 2 physical parameter is supplied to a detector 43. a detector 43 -- the -- the control signal which shows whether the detecting signal which was able to receive the signal part equivalent to the fluctuation 2 physical parameter was beforehand decided to be has is supplied to a control circuit 44. Reception of the control signal which shows that the detecting signal is equipped with the part equivalent to said fluctuation for which it opted beforehand is answered, and a possible-sized signal for a control circuit 44 to enable information recovery is supplied to the information recovery circuit 42. the [ then, / said ] -- only when existence of said fluctuation in 2 physical parameter is detected, the information recorded on the disk is recovered. the [ as which the copy is expressing information ] -- only the fluctuation in 1 physical parameter is expressed and the information recorded on the copy of a record carrier must have been recovered.

[0026] Drawing 1 shows the possible example of the record carrier 1 for using it for the information system by this invention, drawing 1 a is a top view, drawing 1 a and 1 c are the top views where the part 2 of the 1st and 2nd examples of a record carrier 1 was expanded very much, and drawing 1 d shows the small part of the cross section of the part 2 in alignment with line b-b of the 3rd example of a record carrier 1.

[0027] the example of a record carrier 1 shown in drawing 1 b -- the -- the fluctuation in 1 physical parameter has the gestalt of the optically detectable mark 3 which changes by the staging area 4. This optically detectable mark may be the so-called gestalt of a pit. However, a mark also suits that it is optically [ other classes ] detectable. The optically detectable mark is arranged along the truck in which the center line is shown by the reference mark 5. this example -- setting -- the -- the fluctuation in 2 physical parameter is fluctuation of the truck location in the direction which crosses the direction of a truck. This location fluctuation has the gestalt of the truck wave motion known also as radiation direction truck agitation. Such truck agitation may be easily detected by the same beam scan means as being used for detection of the optically detectable mark 3 which is discussed by the other parts of this publication.

[0028] the example shown in drawing 1 c -- setting -- the -- fluctuation of 2 physical

parameter has the gestalt of fluctuation of the width of face of the optically detectable mark 3. The fluctuation in the width of face of a mark 3 serves as additional intensity modulation in the radiation beam which scans a track. On the conditions referred to as not overlapping the frequency spectrum of the component from which the frequency spectrum of the component raised with the pattern of a mark is raised by mark width-of-face fluctuation, both the fluctuation and information in the width of face of a mark 3 may be recovered based on the intensity modulation. [0029] In drawing 1 d, the reference mark 6 shows the transparency substrate. This substrate 6 is covered with the reflecting layer 7. The reflecting layer 7 is covered with the protective layer 8. The mark 3 optically detectable with the gestalt of a pit is formed in this substrate 6. The gestalt of fluctuation of the location of the flat surface on which the optically detectable mark 3 is put has the fluctuation in the 2nd parameter. The location where these flat surfaces differ in drawing 1 d is shown by lines 9 and 10. When scanning a pattern as shown in drawing 1 d by the focusing radiation beam, the fluctuation in the flat surface of a mark 3 serves as a focal error which may be detected easily.

[0030] Drawing 2 shows the pattern of the optical mark 3 and optical staging area 4 to the 4th example of the record carrier 1 for using for the information system by this invention. The die length of a mark 3 and a staging area 4 is equivalent to one or more bit cels of the signal 20 read in the record carrier. In drawing 2, this signal 20 is shown to the case where the pattern of a mark 3 and a staging area 4 is scanned by the fixed line type rate. Die-length T of a bit cel is equivalent to the period T of the data clock of a signal. In the track part shown by the reference mark 21, a bit cel is expressed by the track part which has die length L1, and the bit cel is expressed by the track part which has the die length L2 shorter than die length L1 in the track part shown by the reference mark 22 on the other hand. In other words, the average die length of the mark 3 and staging area 4 to the track part 21 differs from the average die length of the mark 3 and staging area 4 in the track part 22. When recovering from the signal 20 with which it was scanned at the line type rate with a fixed track, and the data clock was read, the fluctuation in the average value of the die length of a mark 3 and a staging area 4 turns into fluctuation of the frequency of the data clock recovered.

[0031] Drawing 3 shows the 5th example of the record carrier for using for the information system by this invention. The track is divided into Groups a and b in this example. The track pitch d1 in Group a is fixed within each group like the track pitch d2 of the track in Group b. However, a track pitch d2 is larger than a track pitch d1. British patent specification 1,516,285th When a track is scanned by the radiation beam as indicated by the number at the detail, this difference in a track pitch may be detected easily, and the publication of said specification is included in the publication by reference here. When a scanning beam is moved in the radiation direction in a record carrier 1 top, existence of the fluctuation in a track pitch may be detected

easily.

[0032] Drawing 5 shows one example of the optical information system by this invention more to the detail.

[0033] The rotation drive motor 50 mechanically combined with the record carrier 1 so that rotation of a shaft 51 of a surrounding record carrier might be produced is formed in this system. In doing so, a record carrier is moved along with the converter in the gestalt of the optical read head 52 of an ordinary class. The optical head 52 is equipped with the radiation source 53 in the gestalt of the semiconductor laser for generating a laser beam 54. This beam 54 is turned to the radiation induction detector 55 by the optical system of an ordinary class through a record carrier 1. This laser beam is modulated according to fluctuation with the 1st parameter and the 2nd parameter. The detecting signal which these modulations are detected by the detector 55 and is equivalent to these modulations can be used on the output terminal of a detector 55. The detecting signal on the output terminal of a detector 55 is supplied to the circuit 56 of an ordinary class which pulls out the focal error signal FE and the tracking error signal RE from these detecting signals. Since the focal control circuit 57 is supplied and a focal control circuit pulls out the energization signal over the focal actuator 58 from this focal error signal, this focal error signal FE is focal 59a of a beam 54. It is maintained in the flat surface of the record carrier on which the optically detectable mark 3 was put. The detector 55, the circuit 56, the focal control circuit 57, and the focal actuator 58 form the focal servo system of an ordinary class.

[0034] The tracking error signal RE is supplied to the tracking control circuit 59, and a tracking control circuit answers an energization signal so that the beam substantially turned to the core of a track 5 may be maintained, and it pulls out the energization signal over the tracking actuator 60 arranged so that a beam 54 might be moved in the radiation direction from the tracking error signal RE. The detector 55, the circuit 56, and the tracking control circuit 59 form the tracking servo system of an ordinary class. The detecting signal on the output terminal of a detector is supplied also to the information recovery circuit 61.

[0035] Furthermore, the scan speed control means for maintaining a scan speed to constant value substantially is prepared in the regenerative apparatus. This scan speed control means may be equipped with a circuit 63, for example, the phase locked loop circuit of an ordinary class, in order to recover a data clock from the detecting signal on the output terminal of a detector 55. The frequency of a data clock is a scale over a scan speed. In order to energize a motor 50 so that the frequency of the recovered data clock may be maintained by about 1 constant value, the signal which directs a data clock frequency is supplied to the motor control circuit 64. A scan speed servo system may be realized also by the other approaches that information read, for example is often realized in a compact disk player based on the filing grace of the so-called first in first out buffer memorized temporarily.

[0036] In being the thing of a class as the record carrier 1 showed to drawing 1 b, it expresses the signal component with which a tracking error signal is started by the radiation direction agitation. To detailed explanation of this phenomenon, it is the Europe patent public presentation official report 0,299,573rd. A number and 0,325,330 A number is referred to and those documents are incorporated here as reference. The frequency of the radiation direction agitation must be chosen so that the frequency of the signal component raised by the agitation may be put on the outside of the bandwidth of a tracking servo loop, and the outside of informational frequency spectrum. Drawing 6 shows as an illustration the location of the frequency spectrum 31 of the signal component raised by the radiation direction agitation placed between the bandwidth of a tracking servo, and the frequency spectrum 30 of the information recorded on the record carrier.

[0037] The signal component within the tracking error signal RE started by the radiation direction agitation is detected by the detector 62. This detector 62 is said document Europe patent public presentation official report 0,299,573rd. A number and 0,325,330 You may be the thing of a class which was indicated by the number at the detail.

[0038] This radiation direction agitation may be agitation which has constant frequency and the fixed amplitude. In that case, a detector may be the thing of a class as shown in drawing 7 . The detector shown in drawing 7 is equipped with the \*\*\*\* passage filter 70 aligned with the frequency of the signal component raised by the radiation direction agitation. The input terminal of this \*\*\*\* passage filter 70 is combined in the circuit 56 so that the tracking error signal RE may be received. The output terminal of the \*\*\*\* passage filter 70 is combined to the input terminal of the rectifier circuit 71 for rectifying the signal component filtered by this filter 70. The rectified signal component is a reference value REF. A comparator 72 is supplied in order to compare this rectified signal.

[0039] The rectified component is a reference value REF. When exceeding, the comparator generates a possible-sized signal, and the signal is supplied to an information recovery circuit, in order to enable recovery of information from the detecting signal on the output terminal of a detector 55.

[0040] Then, information recovery is enabled only when the signal component of the frequency decided beforehand with which the detector 61 was started by the radiation direction agitation is detected. When this component does not exist, information recovery becomes [ being made incompetent with as, and ]. It means that the information recorded without the radiation direction agitation this [ whose ] has said frequency decided beforehand on the record carrier must have been recovered.

[0041] Using the radiation direction agitation which expresses the modulation expressing a sign instead of the radiation direction agitation which has constant frequency and the fixed amplitude is proposed. Such a modulation is the Europe patent public presentation official report 0,299,573rd. The thing or the Europe patent

public presentation official report 0,325,330 of a class which was indicated by the number You may be the thing of a class like FM modulation which was indicated by the number.

[0042] When the modulated radiation direction agitation is used, a detector 62 may be the thing of a class which was indicated by said Europe patent document. Drawing 8 shows the detector 62 of such a class theoretically. This detector is equipped with the \*\*\*\* passage filter 80 aligned with the frequency of the radiation direction agitation. It is combined in a circuit 56 and the input terminal of this filter 80 is so that the tracking error signal RE may be received. The output terminal of this filter 80 is supplied to the demodulator circuit 81, in order to recover the sign expressed by the modulated agitation. The sign recovered by this demodulator circuit 81 is supplied to a comparator circuit 82, in order to compare the sign decided beforehand with this recovered sign. This comparator circuit 82 is the thing of the class which generates a possible-sized signal to the recovery circuit 61, when the sign recovered by the demodulator circuit 81 is in agreement with said sign decided beforehand.

[0043] The information recovery circuit 61 may be the thing of an ordinary class which can give the force with a possible-sized signal.

[0044] Probably, it will be desirable to record the enciphered information or the scrambled information on a record carrier which may be recovered only by using the key sign which was decided beforehand, and which is enciphered or scrambled. In that case, expressing desk rambling or an encryption sign by the modulation of truck agitation is liked. At this time, an information recovery circuit must establish information for a desk rambling circuit or a decryption circuit using the sign directly received from the demodulator circuit 81 for decryption or descrambling. An example of such an information recovery circuit is shown in drawing 9, and the information recovery circuit is equipped with a recovery and the sector-of-calibration circuit 90 of a class ordinary for recovery of the information encoded according to the compact disk criterion. The output signal of the circuit 90 is supplied to the desk rambling or the decryption circuit 91 of an ordinary class, and descrambles or decrypts the information which is in agreement with the sign with which the circuit was directly received from the demodulator circuit 81.

[0045] In order to copy a compact disk, the so-called recordable compact disk is often used, the front-end slot with which the disk expresses the radiation direction agitation is prepared, and a record carrier It is 22kHz when scanned by the nominal scan speed of 1.2 – 1.4 m/sec. The signal component within the radiation direction error signal which has the frequency which is mostly in agreement with a value is produced. [ the agitation ] Said recordable compact disk is the already described Europe patent public presentation official report 0,325,330. It is indicated by the number at the detail.

[0046] In order to prevent the radiation direction agitation copied from the compact disk which has the modulated radiation direction agitation, having the frequency of the

radiation direction agitation of the front-end slot on the compact disk which can record the radiation direction agitation on the compact disk which should be copied, and the frequency which is substantially in agreement is liked. In that case, the frequency spectrum of both agitation duplication and agitation must have been distinguished mutually any longer.

[0047] The example explained previously is suitable for being used for the combination of the record carrier showing truck agitation as shown in drawing 1 b.

[0048] The same circuit may be used when a record carrier as shown in drawing 1 d is used. When using the kind of record carrier, the signal component within a focal error signal is raised instead of within a tracking error signal. In that case, a detector 62 must be supplied instead of a focal error signal being the tracking error signal RE.

[0049] When the record carrier of a class as shown in drawing 2 is used, the frequency of the data clock recovered by the circuit 63 expresses fluctuation. In that case, these fluctuation in a data clock frequency must be supplied to a directions \*\*\*\*\* signal to a detector 62.

[0050] The detector 55, the circuit 63, the motor control circuit 64, and the motor 50 form the scan speed control system. The fluctuation in a data clock frequency must be put on the outside of the bandwidth of a scan speed servo to right actuation. Above, this invention has been indicated in order to use for the combination of an optical information system. However, it should be warned theoretically that this invention is applicable also to the information system of the class of others like a magnetic information system. In such a system, a magnetic record carrier may form a wave-motion truck. Both a magnetic information pattern and the truck wave motion may be detected by the same magnetic read head.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The example of the record carrier for using for the information system by this invention is shown.

[Drawing 2] Another example of the record carrier for using for the information system by this invention is shown.

[Drawing 3] Still more nearly another example of the record carrier for using for the information system by this invention is shown.

[Drawing 4] One example of the information system by this invention is shown.

[Drawing 5] Another example of the information system by this invention is shown.

[Drawing 6] The location of the frequency spectrum of a different signal about mutual is shown.

[Drawing 7] The example of the detector for using into an information system as shown in drawing 5 is shown.

[Drawing 8] Another example of the detector for using into an information system as shown in drawing 5 is shown.

[Drawing 9] Still more nearly another example of the detector for using into an information system as shown in drawing 5 is shown.

[Description of Notations]

- 1 Record Carrier
- 2 A Part of Record Carrier
- 3 Optically Detectable Mark
- 4 Staging Area
- 5 Truck
- 6 Transparence Substrate
- 7 Reflecting Layer
- 8 Protective Layer
- 9 Ten Line
- 20 Signal
- 21 22 Truck part
- 30 31 Frequency spectrum
- 41 Converter
- 42 Information Recovery Circuit
- 43 Detector
- 44 Control Circuit
- 50 Rotation Drive Motor
- 51 Shaft
- 52 Optical Read Head
- 53 Radiation Source
- 54 Laser Beam
- 55 Radiation Induction Detector
- 56 Circuit for Receiving Tracking Error Signal
- 57 Focal Control Circuit
- 58 Focal Actuator
- 59 Tracking Control Circuit
- 59a Focus
- 60 Tracking Actuator
- 61 Information Recovery Circuit
- 62 Detector
- 63 Circuit (for example, Phase Locked Loop Circuit)
- 64 Motor Control Circuit
- 70 \*\*\*\* Passage Filter
- 71 Rectifier Circuit

72 Comparator  
80 Filter  
81 Demodulator Circuit  
82 Comparator Circuit  
90 Recovery and Sector-of-Calibration Circuit  
91 Desk Rambling or Decryption Circuit  
a, b Group  
d1, d2 Track pitch  
FE Focal error signal  
L1, L2, T Die length  
RE Tracking error signal

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